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habits in the winter in South Africa. In those districts where the winter is very cold and sharp frosts prevail, the Shrew lies dormant and bereft of the power of movement." It is in connection with his general remarks on the Soricidæ that the author makes the astonishing statement that "In Europe and other countries where the winter is very cold, and insect life exceedingly scarce, the Shrews seek out some snug, sheltered situation, and hibernate until the return of warm weather, which brings with it an abundance of insect life." Of particular interest in this volume are the chapter on the South African hedgehog and the account of the introduced North American gray squirrel. The gray squirrel is said to have become such a source of vexation to fruit growers that it has been placed on the "vermin list" at Cape Town, and a bounty has been authorized for its destruction.

—N. Hollister.

**Dixon, Joseph.** NOTES ON THE NATURAL HISTORY OF THE BUSHY-TAILED WOOD RATS OF CALIFORNIA. Univ. California Publ. Zool., vol. 21, no. 3, pp. 49-74, pls. 1-3, 3 figs. in text, December 10, 1919.

"It is the function of the present paper," writes the author, "to place on record such facts as have been learned to date in regard to the habits and associational relationships of the bushy-tailed wood rats occurring in California." Following adequate descriptions of the two Californian forms (*Neotoma cinerea cinerea* and *N. c. occidentalis*) the status of the fossil form *Teonomus spelaea* Sinclair from Potter Creek Cave is considered, the author confirming Kellogg's reference of it to the recent *N. c. occidentalis*. The species *cinerea* is boreal in distribution, its altitudinal range being from 5,000 feet, as in Kings River Canyon, to 13,090 feet, on the summit of Mount Lyell.

The life history is taken up under 13 headings, as follows: local associations, mannerisms and behavior, timidity and reflexes, tracks and other sign, houses, hibernation, breeding season, growth of young, relation to other animals, foraging, food, population, and economic status. Of particular interest is a comparative statement of the relative speed of nervous impulses in individual wood rats and certain other small rodents based on shutter-speed necessary to stop all motion when the animals were photographed.  $\frac{1}{15}$  second stopped motion in the bushy-tailed wood rat;  $\frac{1}{10}$  second, alpine chipmunk (*Eutamias alpinus*);  $\frac{1}{5}$  second, California pocket gopher (*Thomomys bottae*), Great Basin pocket mouse (*Perognathus parvus olivaceus*), Tahoe chipmunk (*Eutamias speciosus frater*), and Nelson antelope ground squirrel (*Ammospermophilus nelsoni*);  $\frac{1}{10}$  second, California ground squirrel (*Citellus beecheyi*).

—Walter P. Taylor.

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**ADAMS, CHAS. C., GEORGE P. BURNS, T. L. HANKINSON, BARRINGTON MOORE, AND NORMAN TAYLOR.** Plants and animals of Mount Marcy, New York. Ecology, vol. 1, 1920: part 1, pp. 71-94, (April) August; part 2; pp. 204-233, (July) October; part 3, pp. 274-288, (October) November. (Contains remarks upon the ecological distribution of mammals on Mount Marcy.)

**ANDERSON, MALCOLM PLAYFAIR.** The discovery of the Chinese takin. Nat. Hist., vol. 20, pp. 428-433. September-October, 1920.

ANDREWS, LORING. A chamois hunt in Switzerland. *Forest and Stream*, vol. 90, pp. 231-233. May, 1920.

ANDREWS, ROY CHAPMAN. In Mongolia and North China. *Nat. Hist.*, vol. 20, pp. 356-373. September-October, 1920. (Some experiences in collecting mammals on the American Museum Asiatic Expedition.)

BANNON, ARTHUR H. A bear hunt on the Clearwater. *Forest and Stream*, vol. 90, pp. 103-106, 144, 146. March, 1920. (Experiences along one of the tributaries of the Stikine River in British Columbia.)

BANNON, HENRY. The game ranges of Klappan. *Forest and Stream*, vol. 90, pp. 485-487, 513-518. September, 1920. (Account of the hunting grounds south of the Stikine River in British Columbia.)

— Caribou and moose in Klappan. *Forest and Stream*, vol. 90, pp. 629-631, 660, 661. December, 1920. (Hunting in the Cassiar district, northern British Columbia.)

BARBER, W. E. Commission's state-wide hearings. *Wisconsin Conservationist*, vol. 2, no. 4, p. 5. September, 1920. (Summary of hearings upon methods of protecting the muskrat, mink, and deer from possible extermination in Wisconsin.)

BARNABY, W. C. Whitetail deer in New Hampshire. *Forest and Stream*, vol. 90, pp. 581-584, 612-614. November, 1920.

BELITZ, A. F. On the trail of the white-tail. *Wisconsin Conservationist*, vol. 1, no. 5, p. 1, November, 1919; no. 6, pp. 5, 6, January, 1920; vol. 2, no. 1, pp. 33, 34, March, 1920; no. 3, pp. 7, 8, July, 1920. (An attempt, based upon imaginary grounds and rather illogical reasoning, to prove that the original habitat of the white-tailed deer was in Wisconsin. Uses the name *Cariacus wisconsinensis* for the Wisconsin white-tailed deer, l.c., vol. 1, no. 5, p. 1, November 15, 1919.)

BLAIR, W. REID. Notes on the birth of a chimpanzee. *Zool. Soc. Bull.*, vol. 23, pp. 104-111. September, 1920. (A young chimpanzee, born in the gardens of the New York Zoological Society, lived for eight days.)

BROWN, W. S. Doe with three fawns. *California Fish and Game*, vol. 6, no. 1, p. 37. January, 1920. (Observed in the Lava Bed section of the Modoc National Forest, August, 1919.)

BROWNLOW, O. P. Where do deer sleep? *California Fish and Game*, vol. 6, no. 2, p. 88. April, 1920. (Mule deer in southern Sierras stated to bed within thick cedars or other forest trees on moonlight nights, and in more open spaces during the dark of the moon.)

BURGESS, THORNTON W. The Burgess animal book for children. Pp. i-xvii; 1-363. Boston: Little, Brown, and Co. Price, \$3. November, 1920. (The delightful and now famous characters of the "Bedtime Stories" in book. With numerous colored plates by Louis Agassiz Fuertes.)

BURNETT, W. L. Notes on rodent pests. Eleventh Ann. Rept. State Entomologist of Colorado, pp. 47-62, 5 maps and figs. August, 1920. (Contains maps showing the distribution of *Citellus elegans* and the forms of *Cynomys* in Colorado.)

BURNETT, W. L. A contribution to the life history of the Wyoming ground squirrel (*Citellus elegans*) in Colorado. Part I. Circ. 30, Office of State Entomologist, Colorado Agr. Coll., pp. 1-12, 2 figs. September, 1920.

BURRELL, HARRY. Field notes on the life history of the monotremes.—I. Australian Zool., vol. 1, pt. 8, pp. 231-240, figs. 1-6. July 30, 1920. (Interesting accounts of the echidna and platypus.)

CARHART, ARTHUR H. Live game and forest recreation. Amer. Forestry, vol. 26, pp. 723-727, 9 figs. December, 1920.

CASEY, THOS. L. Remark on family names. Science, n. s., vol. 52, pp. 491, 492. November 19, 1920. (Objects to Oberholser's proposed method of dealing with family names based upon almost identical names of genera.)

CLEAVES, HOWARD H. Rabbit on her nest. Forest and Stream, vol. 90, p. 123. March, 1920. (Description of nest containing seven young found in yard of dwelling house.)

COFFMAN, J. D. Notes on the life history of the black-tailed deer. California Fish and Game, vol. 6, no. 1, pp. 15, 16. January, 1920. (Based on a report by the officials of the Trinity National Forest, California.)

COLTAR, CHARLES. The intelligence of monkeys. Forest and Stream, vol. 90, pp. 15, 34. January, 1920.

DAVIS, MORGAN. Alaska brown bear protection. Forest and Stream, vol. 90, pp. 361, 362, 414, 415. July, 1920. (The widespread interest felt in this matter among sportsmen's associations is evidenced by many letters received by the Boone and Crockett Club.)

DEARBORN, NED. Trapping on the farm. Yearbook Dept. of Agriculture, 1919, pp. 451-484, figs. 1-23. 1920.

— Maintenance of the fur supply. U. S. Dept. Agriculture Circ. 135, pp. 1-12, plates 1-9. November, 1920. (Read before the second annual stated meeting of the American Society of Mammalogists, New York City, May 4, 1920.)

EVERMANN, BARTON WARREN. The northern fur-seal problem as a type of many problems of marine zoology. Papers on the Exploration of the North Pacific Ocean, Bull. Scripps Instit. for Biol. Research, no. 9, pp. 13-26 (dated Dec. 15, 1919), 1920.

— Scientific and economic problems of the mammals and birds of the North Pacific. Papers on the Exploration of the North Pacific Ocean, Bull. Scripps Instit. for Biol. Research, no. 9, pp. 27-34 (dated Dec. 15, 1919). 1920.

FERGUSON, HARRY L. A Cassiar hunt in nineteen-six. Forest and Stream, vol. 90, pp. 5-8, 38. January, 1920. (Observations to the southward of Telegraph Creek, and in the Dease Lake region.)

FLOWER, HENRY C., JR. On the trail of the Lord tiger. Asia, vol. 20, no. 9, pp. 893-897. October, 1920. (Account of hunting a tiger at Dalat, French Indo China. Animal measured in total length, 9 ft.,  $\frac{1}{2}$  inch; length without tail, 6 ft., 3 in.; weight, 375 lbs.)

GIDLEY, J. W. A Pleistocene cave deposit of western Maryland. Ann. Rep. Smithsonian Inst. 1918, pp. 281-287, pls. 1-6. 1920.

GILLESPIE, T. H. Annual report of the Zoological Society of Scotland for the year ending 31st March, 1920. Pp. 1-20. 1920.

GOLDTHWAITE, G. TARLETON. A moose hunt in Nova Scotia. *Forest and Stream*, vol. 90, pp. 638, 657-659. December, 1920.

GRAYSON, ANDREW J. Game in the San Joaquin Valley in 1853. *California Fish and Game*, vol. 6, no. 3, pp. 104-107. July, 1920.

HAAGNER, A. K. National Zoological Gardens of South Africa, Pretoria, Transvaal. Report for the year 1918. Pp. 1-15. 1920. (On December 31, 1918, the Pretoria gardens collection contained 492 mammals of 164 species.)

HARTMAN, CARL G. Studies in the development of the opossum *Didelphys virginiana* L. V. The phenomena of parturition. *Anatomical Record*, vol. 19, no. 5, pp. 1-11 (of separate), October (September 13), 1920. (This important contribution seems to settle all controversy as to how the newly-born marsupial reaches the pouch. Ten-day old opossum embryos, after release by the mother from the liquid medium of "birth," immediately crawl the full three inches to the pouch, without aid, and attach themselves to nipples.)

— The free-martin and its reciprocal: opossum, man, dog. *Science*, n. s., vol. 52, pp. 469-471. November 12, 1920.

HAUSMAN, LEON AUGUSTUS. Mammal fur under the microscope. *Nat. Hist.*, vol. 20, pp. 434-444, 9 figs. September-October, 1920. (A study of the structures and identification characteristics of hairs of mammals. Zoological and industrial importance of methods of determining hairs.)

HINTON, MARTIN A. C. Note on the duikers hitherto referred to *Cephalophus maxwelli*. *Ann. and Mag. Nat. Hist.*, ser. 9, vol. 6, pp. 529-533. December, 1920.

HOGG, JOHN EDWIN. Boar hunting on Santa Cruz. *Outers' Recreation*, vol. 63, pp. 194-196, 238-240. September, 1920. (These pigs are said to be descended from stock placed on the island in 1582. Other mammals mentioned.)

HOLLAND, R. P. How much does a wild deer weigh? *Outers' Recreation*, vol. 62, p. 340. May, 1920. (White-tailed deer killed near Trout Creek, Michigan, weighed 354 pounds, dressed.)

— The spread of the coyote. *Outers' Recreation*, vol. 62, p. 453, June, 1920. (Report of a coyote, suspected to be an escaped animal, shot near Ithaca, New York.)

— Wolf, fox, or dog? *Outers' Recreation*, vol. 63, p. 99. August, 1920. (Account of an animal of doubtful relationships, possibly a hybrid, taken at Rosedale, Winchester County, New York.)

— Elk swim the Columbia. *Outers' Recreation*, vol. 63, p. 421. December, 1920.

HOLLISTER, N. Popular guide to the National Zoological Park. Published by the Smithsonian Institution, pp. 1-60, pls. 1-46. Price, 35 cents. October, 1920.

— Report on the National Zoological Park. *Report of Smithsonian Inst.*, Appendix 4, pp. 75-89. December, 1920. (On June 30, 1920, the collection of animals in the National Zoological Park at Washington included 496 mammals of 166 species.)

HOPKINS, L. S. The hoary bat in Ohio. *Ohio Journ. Science*, vol. 20, no. 2, pp. 35-37. December, 1919. (Account of a specimen taken at Kent, Ohio, August 12, 1919.)

HORNADAY, W. T. The "apes" of Gibraltar. *Zool. Soc. Bull.*, vol. 23, pp. 102-103. September, 1920. (Reported that it is necessary to reduce in numbers the Barbary apes living on Gibraltar.)

— The rescued fur seal industry. *Wisconsin Conservationist*, vol. 2, no. 4, p. 2. September, 1920.

HUNT, H. H. Food of the bobcat. *California Fish and Game*, vol. 6, no. 1, p. 37. January, 1920. (Observations in Monterey district of Santa Barbara National Forest.)

LAWYER, GEORGE A., FRANK L. EARNSHAW, AND NED DEARBORN. Laws relating to fur-bearing animals, 1920. A summary of laws in the United States, Canada, and Newfoundland, relating to trapping, open seasons, propagation, and bounties. *Farmers' Bull.* 1165, U. S. Dept. Agriculture, pp. 1-32, 1920.

LYON, M. W., JR. Family and subfamily names in zoology. *Science*, n. s., vol. 52, pp. 291-292. September 24, 1920.

MACCALLUM, G. A. Autopsy of a black fish. *Science*, n. s., vol. 52, p. 387. October 22, 1920. (Account of a specimen of *Globicephalus melas* from Woods Hole, Massachusetts.)

MATTHEW, W. D. The three-toed horses. A fossil record that provides direct evidence of evolution. *Nat. Hist.*, vol. 20, pp. 473-478. September-October, 1920.

MAXEY, D. W. Wild cat eats chicken. *California Fish and Game*, vol. 6, no. 1, p. 37. January, 1920. (Observations at Gorman, California.)

MCCRACKEN, HAROLD. When the sea otter flourished. *Forest and Stream*, vol. 90, pp. 298, 332, 333. June, 1920. (Some interesting information regarding the life-history of this animal, and the manner in which it was almost exterminated.)

MILLER, GERRIT S., JR. Conflicting views on the problem of man's ancestry. *Amer. Journ. Phys. Anthr.*, vol. 3, pp. 213-245; 2 plates. 1920.

MOODIE, ROY L. The works of Ameghino. *Science*, n. s., vol. 52, p. 469. November 12, 1920. (A complete edition of the scientific writings and correspondence of the late Florentino Ameghino is being financed by the minister of public works of the Province of Buenos Aires, Argentine Republic.)

MURPHY, ROBERT CUSHMAN. Far-distant parks of zoology I. The zoological park of Lima, Peru. *Zool. Soc. Bull.*, vol. 23, pp. 95-100. September, 1920.

NELSON, E. W. Report of chief of Bureau of Biological Survey. U. S. Dept. of Agriculture. Pp. 1-36. 1920. (Contains a summary of the work of the Survey for the fiscal year ended June 30, 1920.)

— Making the game last. *Outers' Recreation*, vol. 63, pp. 182-186, 248-250. September, 1920. (Regarding control and protection of game animals on reservations, national parks, and national forests.)

OSBORN, HENRY FAIRFIELD. The hall of the Age of Man in the American Museum. *Nat. Hist.*, vol. 20, pp. 229-246; 14 figs. May-June, 1920 (rec'd. September 10). (Interesting accounts of murals depicting extinct mammals and their relations to early man.)

PATTERSON, J. T. A new variety of the roof rat. *Science*, n. s., vol. 52, pp. 249-250. September 10, 1920. (A cinnamon variation among specimens of *Rattus alexandrinus* in Texas.)

PERRIN, EDWIN O. On the trail of a deer-mouse. *Forest and Stream*, vol. 90, pp. 306, 307. June, 1920. (General account of habits of *Peromyscus*, with photographs.)

PICKETT, L. M. Raising deer. *Country Life*, vol. 37, pp. 84, 86, 88, 90. January, 1920. (Experiences in breeding white-tailed deer.)

POPE, SAXTON. Hunting grizzly with the bow. *Forest and Stream*, vol. 90, pp. 533-536, 565-568. October, 1920. (Account of killing grizzly bears in Yellowstone National Park by means of bows and arrows.)

RANSOM, BRAYTON HOWARD. Synopsis of the trematode family *Heterophyidæ* with descriptions of a new genus and five new species. *Proc. U. S. Nat. Mus.*, vol. 57, pp. 527-573. 1920. (Mentions definite mammalian hosts of certain species of trematodes.)

ROETH, VALENTINE. Conserve our deer. *Wisconsin Conservationist*, vol. 2, no. 3, pp. 2-3, July, 1920. (Upholds the "one buck law.")

RONDTHALER, HAROLD. Trailing the Kadiak. *Outers' Recreation*, vol. 63, pp. 276, 277, 323-326. October, 1920. (Account of a trip to Alaska in search of the big brown bear.)

ROTHSCHILD, LORD. Preliminary description of a new warthog. *Ann. and Mag. Nat. Hist.*, ser. 9, vol. 6, p. 416. October, 1920. (*Phacocheirus barkeri*, sp. nov., from southwest of Bahr el Ghazal.)

RUTLEDGE, ARCHIBALD. The deer of coastal islands. *Country Life*, vol. 37, pp. 70, 72, 74, 76. February, 1920. (Account of wild deer along coast of South Carolina and Georgia.)

SCHWARZ, FRANK. Mammals of Missouri. *Bull. Saint Louis Nat. Hist. Mus. Assoc.*, vol. 1, pp. 38-44. June, 1920. (List of mammals of Missouri, with brief annotations.)

SCOTT, H. H., AND CLIVE E. LORD. Studies of Tasmanian Cetacea. Part IV. *Delphinus delphis* (the common dolphin). *Royal Soc. Tasmania, Pap. and Proc.*, 1920, pp. 1-10, pls. 1-5. May 29, 1920.

— Studies in Tasmanian mammals, living and extinct. Number I. *Nototherium mitchelli* (a marsupial rhinoceros). *Royal Soc. Tasmania, Pap. and Proc.*, 1920, pp. 13-15. May 29, 1920.

— Studies in Tasmanian mammals, living and extinct. Number II. Section 1. The history of the genus *Nototherium*. Section 2. The osteology of the cervical vertebrae of *Nototherium mitchelli*. *Royal Soc. Tasmania, Pap. and Proc.*, 1920, pp. 17-32. July 24, 1920.

SHELDON, CHARLES. The protection of Alaska game. *Forest and Stream*, vol. 90, pp. 107, 158, 159. March, 1920.

SHIRAS, GEORGE, 3RD. A raccoon explores new country. How one of these pioneers visited a camp on the south shore of Lake Superior, and was encouraged to remain. *Forest and Stream*, vol. 90, pp. 10, 11, 44. January, 1920.

SHOEMAKER, CLARENCE R. Report of the Canadian Arctic expedition 1913-1918. Vol. VII: Crustacea. Part E: Amphipods. Pp. 2-30. Ottawa, September 7, 1920. (Contains records of stomach contents of seals.)

SHUFELDT, R. W. Mammalogy—an anatomical and taxonomic consideration of the group to which man belongs. *Medical Record*, vol. 98, no. 11. Separates repaged 1-38, figs. 1-8. September 11, 1920. Concluded in vol. 98, no. 17, pp. 673-683, figs. 9-14. October 23, 1920. (General account of mam-

mals; definition, relationships, history, evolution, distribution, anatomy, and classification. Closes with a full page table showing the author's views on the classification of the families and higher groups.)

— Foxes—and what we know of them. Amer. Forestry, vol. 26, pp. 673-681, figs. 1-10. November, 1920. (A popular account of the North American representatives of the group.)

— The American antelope. Amer. Forestry, vol. 26, pp. 747-754, 13 figs. December, 1920.

STIGAND, C. H. The bongo—wariest of antelopes. Forest and Stream, vol. 90, pp. 596, 597. November, 1920.

STIVERS, CHARLES G. Forest fires destroy game. California Fish and Game, vol. 6, no. 1, pp. 36, 37. January, 1920. (Killing of deer, rabbits, and squirrels in the Angeles National Forest, California, in autumn of 1919.)

THOMAS, OLDFIELD. On mammals from the lower Amazons in the Goeldi Museum, Para. Ann. and Mag. Nat. Hist., ser. 9, vol. 6, pp. 266-283. September, 1920. (Describes *Depanycterus isabella*, a new genus and species of bat, and eight other new forms of mammals.)

— On small mammals from the Famatina Chain, northwestern Rioja. Ann. and Mag. Nat. Hist., ser. 9, vol. 6, pp. 417-422. October, 1920. (New forms: *Akodon gossei*, *Abrocomafamatina*, *Ctenomys famosus*, and *Lagidium famatinæ*.)

— On mammals from Ceram. Ann. and Mag. Nat. Hist., ser. 9, vol. 6, pp. 422-431. October, 1920. (New species: *Rattus feliceus*, *R. manusela*, *Stenomys ceramicus*, *Uromys fulgens*, *U. arosus*, *U. fraterculus*. New genus and species: *Rhynchopterus prattorum*.)

— Report on the mammals collected by Mr. Edmund Heller during the Peruvian expedition of 1915 under the auspices of Yale University and the National Geographic Society. Proc. U. S. Nat. Museum, vol. 58, pp. 217-249, pls. 14-15. 1920. (Lists 65 species, of which one, *Holochilus incarum*, from Santa Ana, is new.)

— New small mammals from New Guinea. Ann. and Mag. Nat. Hist., ser. 9, vol. 6, pp. 533-537. December, 1920. (New: *Pipistrellus papuanus collinus*, *Emballonura meeki locusta*, *Pogonomys sylvestris*, *P. forbesi vulturinus*, *P. f. mambatus*, *Distoechurus pennatus dryas*, *D. p. amoenus*.)

TRAVIS, THOMAS. Wilderness dwellers. Forest and Stream, Vol. 90, pp. 130, 132, 148, 149, March, 1920; pp. 202, 204, 206, April, 1920; pp. 260, 275-277, May; pp. 316, 318, 337, June; pp. 388, 390, 409, July; pp. 452, 454, 458, August; pp. 506, 508, 510, 512, September; pp. 554, 556, 558, 560, October; pp. 602, 604, 606, 608, November; pp. 650, 652, 654, 656, December, 1920. (Observation and photographing of moose, deer, and other animals in the Tobique region, New Brunswick.)

WASHINGTON PARK ZOOLOGICAL SOCIETY. Tenth annual report; Milwaukee, Wisconsin. 1920. (The Milwaukee zoological gardens collection of mammals includes 102 specimens of 66 species.)